CLAIM AMENDMENTS

1. (Currently amended) A substantially homogeneous catalytic alloy, comprising:

aluminum;

sodium;

platinum; and

lead.

2. (Canceled).

3. (Original) The catalytic alloy of claim 1, further comprising copper.

4. (Original) The catalytic alloy of claim 1, further comprising antimony.

5. (Original) The catalytic alloy of claim 1, further comprising chromium.

6. (Canceled).

7. (Canceled).

8. (Canceled).

9. (Currently amended) The catalytic alloy of claim 3 ~~6~~, further comprising antimony.

10. (Currently amended) The catalytic alloy of claim 3 ~~6~~, further comprising chromium.

11. (Original) The catalytic alloy of claim 9, further comprising chromium.

12. (Original) The catalytic alloy of claim 1, wherein the sodium is present as metallic sodium in an amount ranging from about 0.1 to about 10 parts by weight, per part by weight aluminum.

13. (Original) The catalytic alloy of claim 12, wherein the sodium is present in an amount of about 5 parts by weight per part by weight aluminum.

14. (Original) The catalytic alloy of claim 1, wherein the lead is present as metallic lead in an amount ranging from about 0.1 to about 10 parts by weight lead per part by weight aluminum.

15. (Original) The catalytic alloy of claim 14, wherein the lead is present in an amount of about 7 parts by weight per part by weight aluminum.

16. (Currently amended) The catalytic alloy of claim 1 ~~2~~, wherein the platinum is present as platinum black in an amount ranging from about 0.01 to about 0.1 parts by weight per part by weight of aluminum.

17. (Original) The catalytic alloy of claim 16, wherein the platinum is present in an amount of about 0.04 parts by weight per part by weight of aluminum.

18. (Original) The catalytic alloy of claim 3, wherein the copper is present as metallic copper in an amount ranging from about 10 to about 20 parts by weight per part by weight of aluminum.

19. (Original) The catalytic alloy of claim 18, wherein the copper is present in an amount of about 15 parts by weight per part by weight of aluminum.

20. (Original) The catalytic alloy of claim 4, wherein the antimony is present as metallic antimony in an amount ranging from about 0.5 to about 2.0 parts by weight per part by weight of aluminum.

21. (Original) The catalytic alloy of claim 20, wherein the antimony is present in an amount of about 1.3 parts by weight per part by weight of aluminum.

22. (Original) The catalytic alloy of claim 5, wherein the chromium is present as metallic chromium in an amount ranging from about 0.1 to about 1.0 part by weight per part by weight of aluminum.

23. (Original) The catalytic alloy of claim 22, wherein the chromium is present in an amount of about 0.5 part by weight per part by weight of aluminum.

24. (Original) A method of dissociating water into hydrogen and oxygen, comprising contacting the water with the catalytic alloy of claim 1.

25. (Currently amended) A hydrogen production system, comprising:

(a) a reaction vessel containing a catalytic alloy comprising:

(1) aluminum;

(2) sodium;

(3) platinum; and

(~~3~~4) lead;

(b) one or more inlet conduits adapted to conduct water to the reaction vessel; and

(c) one or more outlet conduits adapted to conduct hydrogen from the reaction vessel.

26. (Currently Amended)A method of producing a substantially homogeneous alloy of aluminum and sodium, comprising:

combining metallic materials comprising aluminum, sodium, and lead in an inert atmosphere;

heating the resulting mixture to a temperature of at least around 600 °C;

maintaining the temperature of this mixture above this minimum until the mixture is substantially molten;

forming the substantially molten mixture into small droplets; and

cooling the resulting molten mixture to form a substantially homogeneous alloy;

wherein the cooling of the molten mixture comprises allowing the small droplets to cool and coalesce into a mass of solid particles.

27. (Canceled).

28. (Currently Amended)The method of claim ~~27~~ 26, wherein the small droplets are formed by directing a stream of the substantially molten mixture onto an oscillating paddle.